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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,830	08/30/2001	Johannes Wilhelmus Maria Sonnemans	ACH2823US	9198
7590	02/23/2005		EXAMINER	
Louis A. Morris Akzo Nobel Inc. 7 Livingstone Avenue Dobbs Ferry, NY 10522			NGUYEN, TAM M	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/942,830

**Applicant(s)**

SONNEMANS ET AL.

**Examiner**

Tam M. Nguyen

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,7-12 and 18-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7-12 and 18-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 19, 2005 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7-12 and 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. (6,251,263) in view of either Takahashi et al. (4,845,068), Takahashi (EP-0357295 A2), or Takahashi (EP-289211 A1).

Hatanaka discloses a hydrodesulfurization process by contacting a hydrocarbon feedstock having a boiling point of from 220-380° C with a catalyst in reaction zones. The reaction zones are operated at a temperature of from 320 to 420° C, at a pressure of from 5 to 15 MPa (50 to 150 bar), at an LHSV of 0.5 to 3h<sup>-1</sup>, and at a hydrogen/oil ratio of from 1000 to 5000 scfb. Hatanaka also discloses that the feedstock comprises alkyl-benzothiophenes and the product has a sulfur

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content of about 1-50 ppm (.0001 - .005 wt.%). The catalyst comprises a metal of Group VIII (e.g., Ni or Co) and Group VIB (See page; abstract; col. 4, lines 25-28, 42-56; col. 7, lines 44-45)

Hatanaka does not disclose that the feed contains 150-500 ppm of sulfur. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hatanaka by using a feed contains the claimed amount of sulfur because it appears that a feed containing any amount of sulfur greater than 0.005 wt.% of sulfur can be used in the process. Since the process is effective to reduce sulfur to less than about 50 ppm (.005 wt%), it would be expected that the results would be similar when using a feed containing the claimed amount of sulfur.

Hatanaka does not disclose that the catalyst comprises sulfur-containing organic additive. However, Takahashi (all three references) disclose a hydrodesulfurization process wherein the process employs a catalyst comprising metals of group VIB, VIII, and mercaptocarboxylic acids (See abstracts of all three references). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hatanaka adding sulfur containing additive to the catalyst as taught by Takahashi because adding a sulfur containing additive to the catalyst would enhance its activity. (See EP-0357295 A2; page 3, lines 24-25; see Takahashi'4845,068, col. 2, lines 30-36).

Claims 1, 7-12 and 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baird et al. (5,935,420) in view of either Takahashi et al. (4,845,068), Takahashi (EP-0357295 A2), or Takahashi (EP-289211 A1).

Baird discloses a hydrodesulfurization process by contacting a hydrocarbon feedstock having a boiling point of from 117-400° C with a catalyst in reaction zones. The reaction zones

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are operated at a temperature of from 40 to 500° C, at a pressure of from 100 to 3,000 psig (6.7 to 207 bar), at an LHSV of 0.1 to 100 h<sup>-1</sup>, and with a hydrogen treat gas rate of about 50-10,000 SCF/B. Baird also discloses that the feedstock comprises alkyl-benzothiophenes with a sulfur amount of 163 and the product has a sulfur content of less than 50 ppm. (See col. 2, line 37 through col. 3, line 42; col. 8, lines 42-51; examples 1-6)

Baird does not disclose that the catalyst comprises sulfur-containing organic additive and does not teach that the catalyst comprises Ni, or Co. However, Takahashi (all three references) disclose a hydrodesulfurization process wherein the process employs a catalyst comprising metals of group VIB, VIII (e.g., Ni), and mercaptocarboxylic acids (See abstracts of all three references). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Baird by using the catalyst of Takahashi because Takahashi discloses that the catalyst is less expensive, simple to prepare and shows higher activity in hydrodesulfurization (see EP-0357295 A2; page 3, lines 24-25).

### ***Response to Arguments***

The argument that the Takahasi references do not deal with ultra deep hydrodesulfurization and; therefore, one of skill in the art would not combine the process of Hatanaka with those of the Takahashi reference is not persuasive because, firstly, the word “ultra-deep” has no value in the claims, so it has essentially no weight in the claimed process. Secondly, Hatanaka teaches an ultra-deep hydrodesulfurization process wherein the final product has a sulfur content of 0.0001 to 0.005 wt.% (1 – 50 ppm). Thirdly, one of skill in the art would add a sulfur-containing additive to the catalyst of Hatanaka as taught by Takahasi because adding

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a sulfur-containing additive to the catalyst would enhance its activity. (See Hatanaka col. 7, lines 43-59; Takahashi'4845,068, col. 2, lines 30-36)

The argument that the Hatanaka reference deal with three different catalysts, each used in a different zone in reactor while the Takahashi references deal with the desulfurization of a feedstock having between 1 and 2 wt. % of sulfur is not persuasive. As discussed above, the catalyst of Hatanaka is modified by adding a sulfur-containing additive to it. The examiner does not modify the process of Hatanaka by using the feedstock of Takahashi or using two reaction zones in the process of Hatanaka. The examiner also likes to point out that the feedstock of Hatanaka also comprises about 1-2 wt. % of sulfur.

The argument that Baird teaches away from using the traditional cobalt/molybdenum or nickel/molybdenum catalyst is not persuasive. The examiner modified the process of Baird by using the catalyst of Takahasi, which comprises Ni or Co, because the catalyst of Takahashi is less expensive, simple to prepare and shows higher activity in hydrodesulfurization.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam M. Nguyen  
Examiner  
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A handwritten signature in black ink, appearing to read "Tam", is written over a horizontal line.

TN